The CHEMIST

DECEMBER, 1936 VOLUME XIII, NO. 9

THE PROFESSION OF CHEMISTRY IN THE DOMINION OF CANADA

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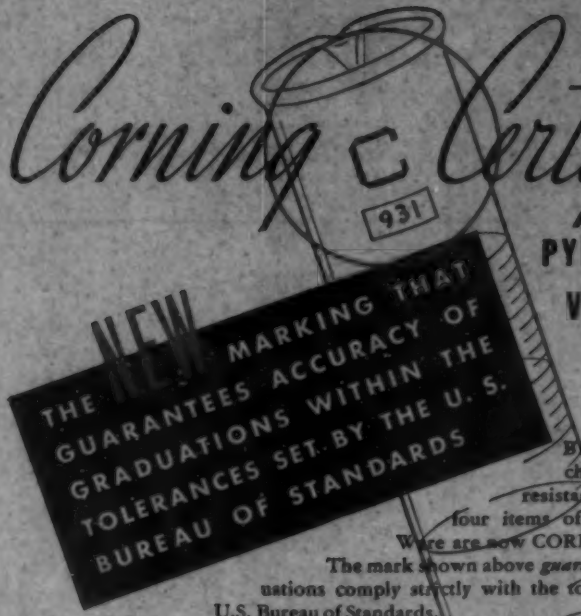

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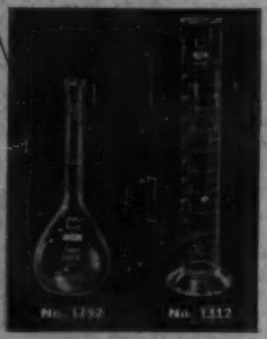

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The CHEMIST

Publication of

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V. F. KIMBALL, *Editor*, 233 Broadway, New York City

VOLUME XIII DECEMBER, 1936 NUMBER 9

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THE AMERICAN INSTITUTE OF CHEMISTS
HOWARD S. NEIMAN, *Secretary*
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The American Institute of Chemists and the American Chemical Society

A letter to a friend in answer to an inquiry regarding membership in The American Institute of Chemists.

Dear E———:

I can well sympathize with your letter of August twelfth regarding membership in the AMERICAN INSTITUTE OF CHEMISTS and your general reaction to considering another society, feeling, as you do, so loyal to the American Chemical Society.

The INSTITUTE OF CHEMISTS, however, is not a competing society; its aims and purposes are distinctly different. It is in reality the only *professional* organization representing and defining the status of "chemist". The American Chemical Society, on the other hand, is a *scientific* society. Its constitution as incorporated under the laws of the State of New York provides only "for the encouragement and advancement of *chemistry* in all its branches; and by its meetings, reports, papers, discussions and publications, to promote scientific interests and inquiry". The INSTITUTE OF CHEMISTS, in comparison, with rigid requirements for Fellowship, defines the professional status of the chemist in much the same manner as the Bar Association does the lawyer, or the American Medical Association the medical man.

The INSTITUTE is not a research or publication society and in no way interferes with the activities of the American Chemical Society. As a matter of fact, it is doubtful whether a chemist would be considered for fellowship as adequate in the practice of his profession who was

not a member of the American Chemical Society. The Western New York Section of the American Chemical Society, covering the membership in Buffalo, Niagara Falls and vicinity, has adopted a resolution endorsing the aims and objects of the INSTITUTE.

One has but to glance at the membership list of Fellows of the INSTITUTE to realize that many of the leaders in the American Chemical Society are active in the INSTITUTE. The President-elect of the American Chemical Society, Dr. Weidlein, and several past presidents, Redman, Herty, Baekeland, Gomberg, are Fellows of the INSTITUTE. Many of the Councilors and Section and Divisional Officers of the American Chemical Society, who largely fix its policies, find no incompatibility with their fellowship in the professional organization. The names of about fifty prominent members of the American Chemical Society who are well known to you occur to me. They constitute such a representative list as to illustrate that there can be no conflict between the Society and the INSTITUTE.

For many years, you may recall, there was an active discussion in the American Chemical Society for classification of members in order to define the status of chemist. This was finally dropped largely due to the difficulty of attempting this after 18,000 members have already been admitted. It seemed to many of us at that time that the logical method was to follow the procedure of having active members of the A. C. S. start a new organization defining rigidly the status and the requirements of chemists and thus have the necessary legal basis to speak for the profession before legislative bodies and as a "Chemist" in court cases. The INSTITUTE in a sense is just that. It is in a position to speak and act on questions pertaining to the profession of chemist, to provide and enforce a code of conduct and ethics in the practice of the profession, and to address legislative bodies regarding licensing or other regulations for the profession. The American Chemical Society by its charter is not in a position to go beyond the welfare of the *science*.

We feel that these two functions while distinct should nevertheless augment and support one another and that the need for the INSTITUTE is justified.

With best personal regards,

Very truly yours,

Robert J. Moore

The Profession of Chemistry in the Dominion of Canada

by **R. T. Elworthy, F.I.C., F.C.I.C.**

The Secretary of the Canadian Institute of Chemistry summarizes the professional position of chemists in Canada.

THE GROWTH and development of the chemical profession in Canada has run parallel to that in the United States and was brought into prominence as a result of the Great War and by the increasing application of technology to industry in the succeeding decade.

As far as can be estimated, there are between 2,000 and 2,500 college trained chemists and chemical engineers in the Dominion, though a number of these may not be actively engaged in the direct application of their profession. During the years of the depression, many chemists, unable to find employment in their own line, were perforce obliged to take up other work, and experience has shown that chemical training with its emphasis on accuracy and its development of observational powers, gives such men many advantages.

It is ten years since a survey has been made of the number of chemists employed in the wide classifications of teaching and research, Government service, consulting and industrial work, but recent estimates made from the membership list of the Canadian Institute of Chemistry and of the Canadian Chemical Association show comparatively little change in the figures obtained at that time, although the actual numbers have increased considerably.

The present estimate is as follows:

Teaching and Research	25%
Government Service	13%
Consulting	5%
Industry	57%

The further division of those employed in industry into the various lines of manufacture is given later.

Practically all the universities in Canada offer courses leading to degrees which include chemistry, and many of them also offer

courses with specialization in chemistry or chemical engineering. In the Maritimes, Dalhousie University and Mount Allison University in Nova Scotia, and the University of New Brunswick at Fredericton, N. B., all have good chemical departments. In Quebec, two French Canadian Universities, Laval at Quebec City and the University of Montreal in Montreal, have large staffs in chemistry, and post graduate work is also carried on. McGill University at Montreal has one of the best chemical schools in Canada. There are three large Universities in Ontario, Queen's University at Kingston, the University of Toronto at Toronto, with an enrollment of about 7,000 students, and the University of Western Ontario at London. Each one has a large chemical department with a well equipped building. Both Queen's and the University of Toronto have courses in chemical engineering, as does McGill University.

McMaster University at Hamilton and the University of Ottawa at Ottawa are smaller institutions which include chemistry in their curricula.

Macdonald College at St. Annes, near Montreal, and the Ontario Agricultural College at Guelph, Ontario, devote special attention to the application of chemistry to agriculture.

Each of the Prairie Provinces has its Provincial University; and well equipped chemical departments are to be found at the University of Manitoba at Winnipeg, the University of Saskatchewan at Saskatoon, and the University of Alberta at Edmonton. The University of British Columbia at Vancouver, B. C., has its graduates in chemistry in positions in all parts of Canada and the United States. There are probably about one hundred permanent staff positions in the chemical departments of Canadian Universities, with three to four hundred assistantships and part time positions. Another two hundred positions in technical schools and collegiate institutions are filled by chemists, although other subjects, such as physics, biology, and mathematics are taught by these men.

Salaries in the Universities run from $600 to $800 for part time assistants up to $4,000 to $6,000 for the Chairs of Chemistry in the larger universities.

The number of students graduating with specialization in chemistry or chemical engineering is about two hundred each year, so far as can be estimated. A number of these students continue

their studies or carry on post graduate research but probably at least one hundred and fifty new men are available each year for industry and government service.

The larger post graduate schools are to be found at McGill University and the University of Toronto, both in the arts department and the school of science, although post graduate research is carried on to a lesser extent in most of the other universities. Some years ago, a number of Canadian students went to universities in the United States for post graduate work, but this movement has not been so frequent during the last five years.

Outside the fellowships, studentships, and bursaries awarded by the Dominion Government through the National Research Council, there are comparatively few sources of financial assistance for chemical research in the Canadian Universities. Wealthy industrialists have not yet been found in Canada to endow chemical and general scientific research to the same proportional extent that exists in the United States.

In the discussion of the teaching of chemistry in Canadian Universities, it must be admitted that biochemistry has been rather overlooked. Yet the departments of biochemistry in the larger universities and in particular, the accomplishments in biochemical research, such as the work of Sir Frederic Banting, Dr. C. H. Best, Dr. J. B. Collip, and their collaborators, have received world wide recognition. The work carried on at the Connaught Laboratories of the University of Toronto, both in research and in the commercial production of insulin and many types of vaccines, places it in the front rank of similar institutions and Canadian biochemists stand second to none.

THE WORK of agricultural and cereal chemists in Canada, particularly the members of the staffs of the universities of the Prairie Provinces and of the various agricultural colleges have meant much to the development of agriculture in Canada. The Dominion Grain Research Laboratories at Winnipeg, under the direction of Dr. W. Geddes, carries on work of great value in connection with the marketing of Canada's wheat crop.

University Teaching

Owing to the relatively small number of positions in the teaching profession, particularly in the universities and the permanent tenure of office, there are few opportunities for chemists in this field, and such positions, when they occur, are usually filled by men who have long held

junior rank. There has been less tendency in recent years to bring mature men from Great Britain and the United States.

Government Service

The Dominion Government is a large employer of chemists and chemical engineers in its various departments, mainly in laboratories in Ottawa; and with the extension of Government regulation in industry and commerce and in the development of Canada's mineral and agricultural resources, the field for chemical work has greatly expanded during the past twenty years.

The National Research Council, with its magnificent laboratories in Ottawa, opened in 1932, provides employment for between forty and fifty chemists in its divisions of chemistry, biology and research information. As these positions are among the best paid in the Government Service, the competition is keen, openings have been relatively few in the last two or three years.

The Ontario Research Foundation, at Toronto, operated under an endowment raised partly by industry and partly by the Provincial Government, also employs a number of chemists.

The Department of Mines, with its Fuel Testing Laboratories, Ore Dressing Laboratories, and Chemical Division, has about twenty-five to thirty chemists and chemical engineers on its staff. The Department of Agriculture, in the Chemistry Division of the Experimental Farm at Ottawa, Seed Testing Laboratories, Dairy Division and Entomological Department, provides work for approximately twenty chemists. The Food and Drugs Laboratories of the Department of Pensions and National Health at Ottawa, with branches in five cities across Canada, also employ about the same number. The Customs and Excise Laboratories and the Wood Preservation and Pulp and Paper Laboratories of the Department of Interior provide positions for still more men. Altogether there are from one hundred and forty to one hundred and fifty chemical positions in the Government Service, although there are also positions not classified as chemical filled by men with chemical training.

Salaries range from $1800 for the junior positions as a minimum, to between $3000 and $4000 for the higher positions. There are a few executive positions at $6000 to $8000.

The various Provincial Governments, particularly the Government of Ontario, employ chemists in the Departments of Health, Highways, Mines and Agriculture.

Consulting Laboratories

There are comparatively few consulting laboratories in Canada, as perhaps is to be expected in a country with as short an industrial development. There is need for enlightenment of the industrialists as to the value of the services that such organizations can render. Competition with universities and more particularly with Government Institutions has not been entirely absent. Such laboratories also work under the handicap of having to pay customs duties on equipment and chemicals, whereas educational and Government departments can import apparatus and supplies duty free. The better known consulting firms are the Milton Hersey Company and J. T. Donald & Co. in Montreal; Thomas Heyes & Sons, and Dr. Zeidler in Toronto; E. T. Sterne Laboratories in Brantford, Ontario; National Testing Laboratories in Winnipeg, and G. S. Eldridge & Co. in Vancouver.

Industry—The General and Heavy Chemical Industries

Although the heavy chemical, fertilizer, explosive and paint industries constitute an important section of the chemical industry in Canada, based on the value of production and sales, comparatively little Canadian research or development work has been carried out, apart from one or two conspicuous exceptions; and few chemists and chemical engineers are employed in proportion to the financial importance of these branches of the chemical industry. Canadian Industries, Ltd., which engages in all these fields of activity, has comparatively few chemists in production work. Although many of its leading technical executives came originally from allied plants in Great Britian or in the United States, the majority of its junior technical employees are graduates of Canadian Universities. Other companies in these lines are mainly agents for imported chemicals.

Shawinigan Chemicals, Ltd., producers of acetic acid, acetone, and many other products based on acetylene syntheses, most of which have been developed in their own research laboratories, employ a considerable number of chemists. Consolidating Mining & Smelting Co. Ltd., at Trail, B. C., with its recent developments in the manufacture of fertilizers, also provides opportunities for a number of chemists, as well as in its base metal operations.

About twenty per cent of industrial chemists and chemical engineers are engaged in these organizations or in the many smaller companies in these industries.

The Mining and Metallurgical Industries

International Nickel Company, with its refineries at Port Colborne and at Sudbury, the Hudson's Bay Mining and Smelting Co., and Ontario Refining Company, all have their quota of chemists and chemical engineers, as do many of the gold mining companies. In general however, there should be a wider field for chemists in Canada's expanding mining and metallurgical industry. At present about sixteen per cent of the chemists in industry are engaged in this field.

The Pulp and Paper Industry

As would be expected from its importance in Canada, the pulp and paper industry employs a fair proportion of the chemists engaged in industry. Most mills have several chemists in their control laboratories and in charge of operations. With the Department of Cellulose Chemistry at McGill University, directed by Dr. H. Hibbert, and the Forest Products Laboratories at Montreal, as well as research laboratories maintained by several of the companies, this industry is perhaps one of the best organized in Canada along chemical lines.

The following is an estimate of the relative numbers of chemists and chemical engineers employed in the various divisions of industry in Canada. No census has been taken for a number of years and the figures have been taken from records of membership in the various technical societies.

Industry	Chemists employed in industry
Heavy chemicals, explosives, fertilizers	15%
Metallurgical and mining	15%
Pulp and paper	13%
Textile, textile supplies, soap	11%
Organic chemicals, plastics, etc.	7%
Rubber	6%
Sugar refining, food products	6%
Milling and cereals	5%
Petroleum refining	4%
Beverages	4%
Paints and inks	3%
Carbonization and gas	3%
Miscellaneous	8%

Increasing numbers of chemists have gone into sales development work and opportunities in this direction should increase.

Very little data are available on the financial rewards to chemists in industry. As all other professions, chemistry has suffered during the depression. At the present time, graduates entering industry receive from $20 to $30 per week. Probably the average salary for a man with a number of years' experience is about $3000, though of course there are a number of executive positions occupied by chemists, bringing much larger financial rewards.

Chemical Organizations in Canada

Chemists in Canada have perhaps been more fortunate in avoiding the multiplicity of chemical organizations that exist in the older and larger countries. Although membership is held in the leading British and United States chemical societies by many chemists in Canada, there has been considerable co-operation and rationalisation, and as a result only two purely Canadian chemical societies exist and these two work in the closest harmony. A joint annual convention is held, usually in June. These are the Canadian Institute of Chemistry, the professional organization, and the Canadian Chemical Association, which is an affiliation of seventeen local chemical societies, membership in which is open to anyone interested in chemistry. Two sections of the Society of Chemical Industry — Ottawa and Montreal — are affiliated with the Canadian Chemical Association.

The Canadian Institute of Chemistry was organized in 1919 under a Dominion Charter, which permits its members to use the designations, F.C.I.C. and A.C.I.C. The membership is at present about five hundred and fifty, with approximately equal numbers of Fellows and Associates. Its aims and objectives correspond closely to those of the AMERICAN INSTITUTE OF CHEMISTS. Qualifications for the junior rank are, broadly, good chemical training together with at least one year's experience. Fellowship rank is limited to chemists over 30 years of age, who hold positions of responsibility. Applications for membership giving details of training and experience are considered by an Examinations Board, although examinations, both written and practical, are occasionally given to men who cannot present satisfactory evidence of professional training.

The Canadian Chemical Association was organized in 1924 and is an affiliation of local societies, which have complete autonomy. A Council, composed of representatives from these societies, meets twice a year. The principal activity of these societies is to hold lectures on technical subjects during the Winter and Spring. Matters of national interest

affecting chemistry and the chemical industry are also the concern of the Canadian Chemical Association.

Membership lists cover about sixteen hundred chemists and people interested in chemistry.

The Society of Chemical Industry has strong sections in Ottawa and in Montreal and less active sections in Toronto, Shawinigan Falls, and Vancouver. A Canadian Council composed of representatives from these sections meets once a year. There is very close co-operation with the Canadian Chemical Association.

Prospects for Chemists in Canada

The indications are that with the improvement of business generally, more positions are opening up for chemists, although most of them are for junior men without experience. It is still very difficult for mature chemists with experience to find employment which will give a financial reward comparable with their training and experience and the statement "too old at forty" seems tragically true. At the same time, men with special experience are not always readily available in Canada. The general attitude of the Immigration authorities is adverse to chemists from other countries entering the Dominion, where it can be shown that equally experienced Canadian chemists are available. One of the problems which the professional bodies, the universities and the industries, themselves, must face is that of the training of young graduates for industrial work. In many of the growing industries in Canada in which chemistry is of increasing importance, there are few with staffs competent or willing to train men for their particular line. They tell the young graduate that he is of no use to them because he has had no experience, but the older man is met with the answer to his request for work that he is too old.

There is surely much work for the professional bodies in striving to obtain better conditions for chemists in industry and in bringing about a greater realization of the value of chemists and chemistry in the mind of the industrial executive.

The New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS will meet on the following evenings: December 18, 1936, February 26, 1937, April 23, 1937, and May 21, 1937. Speakers will be announced later. The May meeting will be the annual chapter business meeting. Unless otherwise notified, these meetings will be held at The Chemists' Club, 52 East 41st Street, New York, N. Y.

You Can't Keep A Chemical Secret

by **Edward Thomas**

LAST year a chemist analyzed bits of metal taken out of an ancient Roman iron chisel dug up by an archeologist in Chesterholm, England, and from the analyses told the archeologist how the chisel was made, what kind of steel it was made from, and also told him that it had actually been used as a chisel.

The chemist said that one-half the chisel edge consisted of the special alloys of iron containing dissolved carbon called troostite and coarse martensite, indicating that the edge was heated to about 900° centigrade and then tempered by "quenching" in water. Pearlite, another alloy of carbon and iron, was found three-quarters of an inch from the cutting edge, so the chemist said only the edge was hardened by tempering. The granular structure on the head of the chisel was distorted, showing that it had been hammered with hard blows when in use as a chisel. About half of the chisel consisted of ferrite, or pure metallic iron, so admixed with carbon that it varied from dead mild steel to a high carbon steel, showing that the steel varied in composition, and must have been the product of a crude process.

Other chemists have pried other secrets out of metals, like the chemist who was asked if he could tell by analysis the age of some copper implements offered the Smithsonian Institution as prehistoric remains. "Yes," said the chemist to the suspicious archeologist to whom they were shown, "If the implements were made from copper bought from the Spaniards, they contain arsenic. But if they were made by Indians before the coming of the white men, they contain silicon, for the Indians knew nothing of any kind of copper except the silicon-containing Lake copper, from around Lake Superior." The chemist analyzed the so-called implements and found they were practically free from either arsenic or silicon. In fact, he found they were made from the highest grade of electrolytic copper—and no electrolytic copper, being made by electrolysis, can be as much as fifty years old.

In a little archeological museum, in the modern city of Cuzco, the ancient Inca capital of Peru, the visitor is shown hardened copper chisels dug up around the foundations of prehistoric walls still standing in the city. He is told chemists have analyzed the metal in those copper chisels and have discovered that it is hardened with gold and silver alloyed in it. Probably the ancient Inca workmen who made the

chisels did not know how to mix molten metals to alloy them, but roasted and melted up ores containing gold, silver, and copper in the right proportions.

About thirty-five years ago an envelope manufacturer found that the paper he was getting from a certain paper-maker was unsatisfactory, and said it must be rosin-sized, although guaranteed to be animal-sized. When the paper-maker insisted that he was wrong, the envelope manufacturer sent samples of the paper to a chemist, had them analyzed, and showed the extracted rosin to the paper-maker.

A RED-HAIRED intelligent-looking man was one of many chemical inventors who have not yet taken to heart the lessons they should have learned from what those analytical chemists found out about iron and copper tools. This red-haired inventor seated himself at my desk saying, "Your friend, John Jones, my class-mate, knows I am making a secret composition for treating rubber so as to make it more plastic, that is to make it mill easier. Mr. Jones said he thought I was taking chances and said I had better talk with you. So here I am."

In answer to my question whether he knew much about rubber, he said, "I worked for the ——— Rubber Company for ten years, a good part of the time on analytical work, and part of the time on a study of milling rubber. You know, they mill rubber by putting it back and forth through rolls to make it plastic and workable. Milling it seems to alter the structure of the rubber molecule. In fact I got the idea while I was with them that I ought to be able to develop something of the sort of what I am now selling. I got sick from benzol fumes, and sued them, but lost out because my lawyer didn't know chemistry and bungled the trial in court. Then I tested out my ideas, found that one was all right, and now the Company is buying my composition. They are paying me a fancy price for it." I looked at the inventor. He was desperately in earnest. He continued, "I'm getting a living out of it, but I have to be both chemist and salesman, and I must be sure I am safe." I began by saying, "You know the kind of detective work done by chemists in the year 1917, when they analyzed the liquid "gas" in unexploded German gas shells and deduced a method of manufacture by study of the impurities in the liquid. They told the Allies how to increase enormously the production of the poison gas by adopting the efficient and rapid German procedure for making the gas instead of the inefficient and slow procedure previously devised by other chemists of the Allies."

"Yes," was the answer, "but my material is more than ninety percent inert, and, besides, I put another inert material in as a bluff." "But" I insisted, "when you worked for the ——— Rubber Company, didn't they analyze any secret compositions to learn how to make them themselves?" "Yes, we had men doing that all the time." "How long," I continued, "would it have taken you to analyze material such as that which you are furnishing them?" "Over eighteen months, but probably less than two years." He paused, "I guess you're saving my life. I'll be back in a few days with the data for a patent application."

Eventually we prepared a patent application which required some research to enable us to learn on what scientific basis we should word the description and claims of the application. The patent application and the research connected with it led to further research and a second patent application on modified and better materials, and the second patent application led to a third.

Meanwhile, the inventor discovered that his patent applications had put his business on a firm basis so that a practical business man was willing to go into partnership with him. Then, under the guidance of the business man, the business grew until one of the largest dealers of rubber chemicals in the world offered to buy the business. Progress for that inventor had been rapid—thirteen months after he first entered my office seeking to do a little more than earn a bare living, he was fairly launched on "easy street" by turning to patent protection instead of trusting to secrecy.

AN INFRINGER of a patent has as much to learn about secret processes as an inventor, as was discovered by one of the very large makers of drugs when he was infringing a patent which covered a process of recovering vitamins. That process depended upon turning into soap the oils which contained the vitamin and then extracting the vitamin with a special modern solvent containing a certain amount of chlorine. The infringer of the patent thought he was safe when he carried out the process with the aid of only two workmen behind locked factory doors, but the owner of the patent saw fifty-gallon iron drums of the special solvent trucked into the factory, bought some of the recovered vitamins, had them analyzed, and discovered that he was able to prove what the infringer was doing. The owner of the patent sued the infringer and collected the damages to which he was entitled.

Another owner of a patent, this time a patent on making metal smoothing files for machinists' use, was less successful, because he apparently was trying to use his patent as a sort of hold-up weapon. He sued a maker of files who had been in the file-making business for more than fifty years never taking out any patents but always making files by a secret process. The file-making business was so old that the founder had died and his grandsons owned and were operating the factory. When the owner of the newly-issued patent took his case to court, the firm of file makers produced files made many years before the year which patentee claimed as the date of his invention, and showed that they were still making files that looked exactly like those fifty-year old files. They also said that they and their fathers and grandfather had always used the same procedures in making files. The Judge decided that the old procedure of making the files could not infringe the newly-issued patent.

Other manufacturers have been afraid of being similarly sued by inventors who get patents on processes that are actually in use unknown to the Patent Office Examiners. These manufacturers take out patents on all their processes in some country, such as France where anything can be patented—the Patent Office not asking whether the invention is really new or not. By these otherwise useless patents they block the issuing of any new patent which might be used as a basis for suing them.

Some inventors have thought they might make large profits, by manufacturing for several years, by a secret process, some articles they have invented, and then by patenting the secret process when it seems likely to be found out. Such a program proved to be useless when Macbeth-Evans Glass Company sued General Electric Company for infringing its patented "method and batch or mixture for making glass".

In the course of the patent law suit, the General Electric Company lawyers proved that the inventor George A. Macbeth invented the method and batch before the fall of the year 1903, but only applied for a patent in 1913. He applied for the patent because in May, 1910, one of the Macbeth-Evans employees had left the Company and given the secret to a rival, the Jefferson Glass Company, who began to make and sell glass produced according to the secret formula. The Judge who first heard the case and the Judges of the Court that heard it on appeal, all held that the inventor by failing to apply for a patent within a reasonable time had abandoned his rights to a patent and that, therefore, the patent was of no effect.

SECRET processes and formulas do not get into Court as often as they used to, because fifty or more years ago secret processes and formulas were bought and sold a great deal, and in those days many people were accused of betraying the secrets with which they were entrusted.

My father, about 1880, when, in addition to being professor of history, he was manager of the property and buildings of a small college, bought from a travelling soapmaker a formula for making soap from cotton seed oil, soda, and ammonia. The soap was made and used for years in the college laundry with great satisfaction. In those days no chemist was able to analyze a soap and tell what fats or oils it was made from, unless it was made from some of the very peculiar oils like coconut oil or castor oil. But since then chemistry has advanced by enormous strides. One yard-stick for measuring this advance in chemistry is *Chemical Abstracts,* a semi-monthly journal called, "The Key to the World's Chemical Literature."

In every issue are published hundreds of summaries of journal articles on chemical research and chemical analysis. The editors put out the first issue in January, 1907, and in that year they published abstracts or summaries of 7,975 magazine and journal articles on chemistry. The number grew until, in the year 1913, they published 19,025 summaries or abstracts.

The war set back chemistry, so that in the year 1918, they published only 9,283 abstracts. But by 1923, progress had caught up with 1913, and kept speeding up, until in 1931, the twenty-fifth year, they published 32,278 abstracts, or more than four times the number published in 1907.

The rate of progress has since kept on growing at the same rate of speed. In 1935 they published over 42,000 abstracts. The editors state that they have always adhered to the same system in selecting articles to abstract, so their work seems to measure chemical progress fairly.

If the Germans could not keep an important chemical secret for two years during the Great War, nor a paper maker keep his secret two years earlier, no one can hope to keep a valuable chemical secret today for much more than a year.

Chemical progress is shown by the growth of *Chemical Abstracts* to have nearly multiplied its speed by five since 1918. Chemists are applying the same methods for solving commercial problems and discovering commercial secrets that they have been applying for years to

scientific research. For, in reality, the problem of solving a commercial problem is much the same as the problem of solving the age of an ancient rock taken, for example, from Bedford, forty miles north of New York City, or from the wilds of Canada.

To ascertain the age of the rock, the chemist selects a fragment containing the radio-active metal uranium, which turns into the metal lead at a known rate of speed, though very slowly, and then analyzes, in his laboratory in the Geological Survey in Washington, the fragment for uranium and lead. From the proportion of lead given by his analyses, he easily computes the age of the rock.

And the search for an unknown material put into a secret formula, used by a rival factory, is much the same as was the search by Professor Urey of Columbia University, for heavy water, predicted by mathematical chemists, and discovered by Urey as a fraction of one per cent mixed in the water left over in electroplating baths. When Urey started on his search, he had only guesses as to the properties of what he was looking for, but nevertheless he found heavy water.

The Patent Office in Washington has turned out to be the guardian of chemical improvements. In the vaults of the Patent Office the inventor registers his improvement by filing his patent application in the Patent Office as a secret. When he is ready to sell his secret, the official evidence secretly kept in the Patent Office protects his proof that he is the first inventor. When he has sold his invention, he unlocks his secret at the time he wants, by getting officially certified copies of the dated application papers held by the Patent Office. Thus the independent struggling inventor is prepared to deal safely with a great corporation, if he so desires, and does not run the risk of staking his future on being able to keep secret the chemicals he uses.

THE CHEMIST wishes all its readers a
Merry Christmas and a Happy New Year

BOOKS

COLLOID SYMPOSIUM MONOGRAPH.

This book contains the papers presented at the Twelfth Symposium on Colloid Chemistry held at Ithaca, New York, in June, 1935, and is edited by Harry Boyer Weiser, Professor of Chemistry, The Rice Institute.

These papers naturally contain the latest advances in colloid chemistry, and among the subjects treated are the following: The constitution of hydrous oxide sols from X-ray diffraction studies; electrokinetics —streaming potential in small capillaries; studies on silicic acid gels— influence of temperature and acid upon the time of set; X-ray spectrography of alkali celloloses; the oxide film on passive iron; the phase rule in colloid chemistry; the determination of contact angles from measurements of the dimensions of small bubbles and drops—the Sessile drop method for obtuse angles; adsorption at crystal-solution interfaces —the concentration of foreign substances in solution relative to the quantity adsorbed by the Host crystal; spectroscopic estimation of adsorbed ions; vapor pressure—water content relations for certain typical soil colloids; stream potentials and D. C. surface conductivities in small capillaries; adsorption by diatomaceous filters; adsorption and diffusion in Zeolite crystals; dynamic dispersions and emulsification; the adsorption of water vapor by the growth elements of the sapwood and by the heartwood of southern pine; and a hydrate decomposition mechanism.

This is a most valuable book for those interested in the latest achievements in colloid chemistry, and a copy of it should be in every chemist's library. (156 pages, copiously illustrated by photographs and diagrams.) Price $3.00. Copies may be obtained from THE CHEMIST.

—HOWARD S. NEIMAN, F.A.I.C.

Geologist Wanted

12-1-36 Geologist between thirty-two and forty years of age, with Ph.D. degree, and five years experience in prospecting and study of mineral deposits, particularly gold, is wanted for position in Philippines. Three year contract. Salary: $4,800 U. S. currency.

Mining Engineer Wanted

12-2-36 Mining Engineer between thirty-two and forty years of age, college graduate, with five years experience in operating a mine, particularly lode mining of gold, is wanted for position in Philippines. Three year contract. Salary: $4,800 U. S. currency.

Research

"Research," said Charles F. Kettering at a General Motors' luncheon given in tribute to his important contributions to the advancement of transportation, "is nothing but looking forward to see in which direction industry may or may not go. We must regard research as an insurance policy. In doing research work on something that has never yet been done, there is no possible way to forecast how much it will cost and when it will be done, or how much it will be worth if and when it is finished. You will have to take these things on faith. Faith and patience are the two fundamentals upon which all research organizations are built.

"We have defined research, in trying to get it in a concrete form, in various ways. We say in our particular business, 'Research is to keep you reasonably dissatisfied with what you have.' Another definition is 'to find out what you are going to do when you can't keep on doing what you are doing now.' "

Among the guests at the luncheon were the heads of other large research organizations, among them W. D. Coolidge, F.A.I.C., of General Electric; W. A. Gibbons, F.A.I.C., of the United States Rubber laboratories; F. B. Jewett, of Bell Laboratories, and John Johnston of the United States Steel Corporation.

Ernest J. Manfredo

THE AMERICAN INSTITUTE OF CHEMISTS has just been informed of the death of one of its Fellows.

Ernest J. Manfredo was born in New York City in 1897. He received the B. S. degree from the College of the City of New York, and the A.M. and Ph.D. degrees from Columbia University. From 1919 until his death in August, 1936, Dr. Manfredo was employed by the Department of Purchase of City of New York in its testing laboratories. He possessed a large and versatile knowledge of chemistry which served him well in his work, which required the analysis and testing of thousands of commercial products in order to protect the City's interests.

Dr. Manfredo became a member of THE AMERICAN INSTITUTE OF CHEMISTS in 1929.

COUNCIL

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CHAPTER REPRESENTATIVES

New York	*Niagara*	*Philadelphia*	*Washington*
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October Meeting

The one-hundred and thirty-fifth meeting of the National Council of THE AMERICAN INSTITUTE OF CHEMISTS was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on October 22, 1936, at 6:00 o'clock P.M. President Maximilian Toch presided. The following officers and councilors were present: Messrs: F. G. Breyer, B. H. Knight, H. S. Neiman, W. T. Read, A. Rogers, M. Toch, and F. W. Zons. Miss V. F. Kimball was also present.

The minutes of the previous meeting were approved. The Treasurer's report, showing $423.82 cash on hand, was accepted and ordered filed. The Secretary was requested to furnish the Treasurer a statement of assets in the form of unpaid dues or advertising each month.

The Secretary read a letter from the Secretary of the Washington Chapter inviting the INSTITUTE to hold its next annual meeting in Washington. The Secretary was requested to reply that the place of the annual meeting will not be decided until January.

A letter from the Vice-president, Robert J. Moore, was read, and upon motion made and seconded, it was decided that members should be encouraged to use the degree, F.A.I.C., after their names, but that the emblem should be used only on the official stationery and publications of the INSTITUTE. The Secretary was instructed to send this information to the Washington Chapter, which had requested it.

Upon motion made and seconded, the following additional members were appointed to the Committee on Membership: Charles W. Rivise, to represent

the Pennsylvania Chapter; Howard W. Post, to represent the Niagara Chapter; and Edward M. Chase, to represent the West Coast.

The Secretary read letters from several members accepting their positions on the committees appointed at the September meeting of the INSTITUTE.

The Secretary reported on the present standing of the INSTITUTE membership.

Upon motion made and seconded, the following new members were elected:

FELLOWS

PERRY A. BOND, *Associate Professor*, University of Iowa, Iowa City, Iowa.

H. C. BRILL, *Professor and Head* of the Department of Chemistry, Miami University, Oxford, Ohio.

MILTON BURTON, Department of Chemistry, New York University, New York, N. Y.

LEO M. CHRISTENSEN, *Secretary-treasurer*, The Chemical Foundation of Kansas, Atchison, Kansas.

FRIEND E. CLARK, *Head*, Department of Chemistry, West Virginia University, Morgantown, W. Va.

JAMES E. COPENHAVER, *Associate Professor*, Department of Chemistry, University of South Carolina, Columbia, S. C.

FRANK W. DOUGLAS, *Professor*, Colorado College, Colorado Springs, Colo.

WILLIAM DREYFUS, *Director of Chemical Department*, West Disinfecting Company, Long Island City, N. Y.

LUCIUS W. ELDER, *Research Chemist*, General Foods Corporation, Battle Creek, Mich.

GEORGE W. FIERO, *Associate Professor of Materia Medica*, School of Pharmacy, University of Buffalo, Buffalo, N. Y.

HOWARD W. GOULD, *Head Department of Physical Science*, Northern Illinois State Teachers College, DeKalb, Ill.

GEORGE A. HOWLAND, *Market Research*, Tennessee Corporation, Atlanta, Ga.

LOTTIE E. MUNN, *Professor of Chemistry*, Lake Erie College, Painesville, Ohio.

SIDNEY H. ROBERTS, *Chemist*, Medical Department, Aetna Life Insurance Company, Hartford, Conn.

WALTER M. SCOTT, *Consulting Chemist*, Gustavus J. Esselen, Inc., Boston, Mass.

WILLIAM T. WHITE, *Assistant Chemist*, Tennessee Valley Authority, Fertilizer Works, Wilson Dam, Alabama.

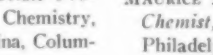
ASSOCIATES

SIDNEY E. MILLER, *Research Chemist*, General Mills, Inc., Minneapolis, Minn.

MAURICE L. MOORE, *Organic Research Chemist*, Sharpe and Dohme, Inc., Philadelphia, Penna.

Upon motion made and seconded, the Committee on Membership was authorized to extend its activities to secure a large Junior and Associate membership, and to use any means which it may find suitable to achieve its aims.

There being no further business, adjournment was taken.



Reprinted in:

Canadian Chemistry and Metallurgy, "Simultaneous Reactions," by Howard W. Post, F.A.I.C.

Opportunity, "The Wizard of Tuskegee," by W. Wade Moss, F.A.I.C.

Stamp Digest, "Chemists in Philately," by James N. Taylor, F.A.I.C.

All of these articles appeared originally in THE CHEMIST for October, 1936.

CHAPTERS

New York

Chairman, Raymond E. Kirk *Vice-chairman,* D. D. Berolzheimer
Secretary-treasurer, James W. H. Randall
52 East 41st Street
New York, N. Y.
Council Representative, Lloyd Van Doren

Niagara

Chairman, Groves H. Cartledge *Vice-chairman,* Howard W. Post
Secretary-treasurer, William R. Sheridan
1439 Kenmore Avenue
Kenmore, New York
News Reporter to THE CHEMIST, William A. Smith
Council Representative, Arthur W. Burwell

A dinner meeting of the Niagara Chapter was held on November 20, 1936, at Red Coach Inn, Niagara Falls, N. Y. There were fifteen members present. Dr. R. C. Benner was introduced as the new member.

The Committee on Ethics drew attention to the recent criticism by the American Medical Association with reference to certain chemical papers delivered at the Pittsburgh meeting of The American Chemical Society. As all chemists know, the facts are that chemists' contributions to medicine far outweigh the contributions of members of the American Medical Association, and it was moved by Dr. Burwell and seconded by Dr. Rasch that a resolution be prepared and sent to the main body of THE AMERICAN INSTITUTE OF CHEMISTS protesting the unwarranted attitude of the American Medical Association in condemning those who are making scientific contributions to the welfare of humanity.

The Welfare Committee reported that it had no employable chemists on its lists at the present time.

Dr. Sheridan of the Advisory Committee to the Grosvenor Library of Buffalo reported that the key list to periodicals and new books in the various industrial libraries in the Buffalo-Niagara district could be obtained by sending twenty-five cents to the Library.

At the conclusion of the business program, Dr. Cartledge spoke on the "Technical Man in Court." The use of technical men as advisers to the court has recently been growing in importance. In a recent suit, for example, the court engaged the services of a special master who took thirteen volumes of testimony and employed three or four men for several months conducting confirmatory experiments. The impression is that a movement is now on foot to make this type of court procedure general where involved technical questions concern the court. In a recent report of the Science Advisory Board, it was noted that several committees had been ap-

pointed to conduct research on different problems. One of these committees has reported with reference to patent litigation and made two recommendations: First the simplification of court procedure—reduction of the number of courts from twelve to one—with permanent, properly qualified judges, scientifically trained and adequately compensated to attract the best personnel. This recommendation proposed five judges, three of which would constitute a quorum. The second recommendation was that proper, adequate, scientific advice be provided in patent equity cases.

A bill covering the first resolution and partially covering the second, called the McAdoo Bill, is now before the Judiciary Committee of the Senate. It is our understanding that this bill provides for a "List of Advisers to the Court" which the court is compelled to use either as advisers or as technical jurors. Compensation is fixed at $13,500 for the presiding judge and $13,000 for the other four judges, all of whom are to be appointed by the President and confirmed by the Senate. Scientific advisers are to receive $12,000 and shall be prohibited from engaging in any other activities. Judges are appointed for life or good behavior, but advisers shall be removed at the pleasure of the court. This court is to be open at all times and to hold sessions in the various judicial districts, rendering its opinions in writing which shall be certified to the Commissioner of Patents.

Quite a little discussion developed with reference to the subject. Leaders in the discussion were Dr. Benner, Dr. Burwell and Mr. Koethen.

Pennsylvania

Chairman, Joseph W. E. Harrisson *Vice-chairman*, Lewis D. Newitt
Secretary-treasurer, Avenir Proskouriakoff
67 Fairview Avenue
Lansdowne, Penna.
Council Representative, Charles W. Rivise

Washington

Honorary President, Charles E. Munroe *President*, Louis N. Markwood
Vice-President, Norris W. Matthews *Treasurer*, James B. Martin
Secretary, Ralph B. Deemer
213 Maple Avenue, Takoma Park, Maryland.

News Reporter to THE CHEMIST, James F. Couch
Council Representative, Louis N. Markwood

Leo Horowitz, J.A.I.C., has legally changed his name to Leo Howard. He is production manager of the Felton Chemical Company, Brooklyn, N. Y.

Ephraim Freedman, F.A.I.C., was recently re-elected a director of the U. S. Institute for Textile Research, Inc.

NEWS

The Association of Consulting Chemists and Chemical Engineers elected the following officers for the coming season: President, Frank G. Breyer, F.A.I.C., Vice-president, Ralph W. Bailey; Secretary, Bernard L. Oser, F.A.I.C.; Treasurer, Alvin C. Purdy. Gustavus J. Esselen, F.A.I.C., William M. Grosvenor, Jr., and Preston S. Miller, were elected directors for three years.

The U. S. Institute for Textile Research, Inc., announces the election of the following officers: President, Francis P. Garvan; Vice-presidents: E. H. Killheffer, Alban Eavenson, Louis A. Olney, Edward R. Schwarz and Harold DeW. Smith; Treasurer, Ernest N. Hood; Secretary, Charles H. Clark.

To determine dust concentration in the atmosphere, Bausch and Lomb Optical Company has developed a machine called the "Dust Counter," which will enable dust counts to be made easily and accurately without extensive training or experience by the operator. Originally designed with the collaboration of an insurance company to assist the study of silicosis as an occupational disease, it is also practical for use in determining the explosive concentrations of certain dusts.

M. L. Crossley, F.A.I.C., sailed for Europe on November 26th, to be gone several weeks on a business trip.

Jerome Alexander, F.A.I.C., presided at the round table meeting of The American Institute of the City of New York held November 13th. The topic was "Bridging the Gap between Masses and Molecules."

The Philip A. Conné Gold Medal of The Chemists' Club has been awarded for 1936 to Dr. Donald Dexter Van Slyke of the Rockefeller Institute for Medical Research for "systematic and painstaking work of immense importance to clinical medicine." The medal is in recognition of Dr. Van Slyke's work in blood analysis and gasometric microanalysis and of his research on respiratory and renal reactions, diabetes, and nephritis.

Foster Dee Snell addressed the Association of Textile Laboratories and Technologists on October seventh at the Hotel Wolcott, New York, N. Y. His subject was "Some Factors in Detergency."

Charles C. Concannon, F. A. I. C., plans to go by airplane from Miami on December eighteenth to South America, stopping at Puerto Rico, Belize, Trinidad, and arriving at Rio de Janeiro on Christmas Day. He will then fly to Chile and Peru on the West Coast of South America and return by plane.

John R. Parsons, Consultant, will speak on "The Chemist in Air Conditioning" at the New York Chapter Meeting of THE INSTITUTE on December 18th, at the Chemists' Club.

OUR NEW MEMBERS

S. D. AVERITT, F.A.I.C., was graduated from Bethel College, and received the M.S. degree from the University of Kentucky. Specializing in soils, insecticides, and waters, he is chemist at the Kentucky Agricultural Experiment Station, Lexington, Ky.

WILLIAM D. COOLIDGE, F.A.I.C., obtained the B.S. degree from Massachusetts Institute of Technology; the Ph.D. from the University of Leipzig. In 1905, he began working for General Electric Company as research physicochemist. He is now director of the Research Laboratory of that Company, at Schenectady, New York.

IRVING A. COWPERTHWAITE, F.A.I.C., was graduated from Massachusetts Institute of Technology, and continued his study at Columbia University from which he received the Ph.D. degree. Particularly interested in the teaching of physical and inorganic chemistry, and research in solutions of electrolytes, he is author or co-author of more than sixteen publications. His title is research associate in science education at Teachers' College, Columbia University, New York, N. Y.

ROBERT J. CROSS, F.A.I.C., holds the A.M. degree from Stamford University and has also studied at the University of California. He specializes in the manufacture of infant foods, lactose, amino acids, canned cream, milk products, and vitamins. He is the author of several publications and holds several patents. He is superintendent of the Vitamin Department and Maintenance of the S. M. A. Corporation, Cleveland, Ohio.

GEOFFREY E. CUNNINGHAM, F.A.I.C., received two degrees from Tulane University of Louisiana, and the Ph.D. degree from The Rice Institute. He is author or co-author of a number of publications on his preferred subjects of inorganic chemistry, physical chemistry, and colloids. He is associate professor of chemistry at Clarkson College of Technology, Potsdam, N. Y.

ARTHUR B. CUMMINS, F.A.I.C., is a graduate of the University of Chicago, and has the Ph.D. degree from the University of California. Specializing in the technology and applications of diatomaceous earth; filtration and filter aids; asbestos fibers; heat insulations; mineral wools; refractory cements; magnesia and basic magnesium carbonate; and non-metallic minerals, he holds eight patents in these fields and is the author of several publications. He is manager of Celite Research and research engineer with the Johns-Manville Corporation, Manville, N. J.

JOHN L. DANIEL, F.A.I.C., received the A.B. degree from Hampden-Sydney College, and the A.M. degree from Washington and Lee University. He specializes in solubilities and solutions. He is professor of chemistry at Georgia School of Technology, Atlanta, Ga.

LEWIS DAVIS, F.A.I.C., obtained the B.S. degree from Worcester Polytechnic Institute and the M.S. degree from Massachusetts Institute of Technology. Specializing in gummed and coated paper, enzymes, and toxins, he is the author of several publications on these subjects. He is Secretary-treasurer of Davis and Bennett, Inc., Worcester, Mass.

S. H. DIGGS, F.A.I.C. received the Ph.D. degree from the University of Virginia. He is the author of a number of technical papers concerned with oil refining, and has also written miscellaneous articles on racial psychology, philosophy, etc., for other publications. He has assigned about a dozen patents connected with oil refining to The Standard Oil Company of Indiana. His position is director of research of the Rocky Mountain Division, Standard Oil Company, Casper, Wyoming.

R. P. DINSMORE, F.A.I.C., was graduated from Massachusetts Institute of Technology. He specializes in general industrial chemistry, petroleum, paints, varnishes and resins, rubber and allied substances. He is the author of several technical papers. Twenty-two years ago he was employed by The Goodyear Tire and Rubber Company on the technical staff. He is now assistant to the vice-president in charge of research and development of new products for that company at Akron, Ohio.

FRANCIS D. DODGE, F.A.I.C., obtained the Ph.D. degree from Columbia University, and later studied at Heidelberg University. He has had forty-five years of manufacturing experience with essential oils and isolates, and aromatic chemicals, for the Dodge and Olcott Company, of which he is works manager and research director, at Bayonne, N. J.

MERRILL JAMES DORCAS, F.A.I.C., studied at Baker University and at Harvard University, from which he received the Ph.D. degree. Specializing in inorganic chemistry, atomic weights, and the production and utilization of ultra-violet radiation, he is author or co-author of twenty technical papers. He is advisory engineer for the National Carbon Company, Inc., Cleveland, Ohio.

BRYANT S. DRAKE, F.A.I.C., is a graduate of the University of California. He is particularly interested in nitrogen in California crude oils; nitric acid, and low temperature concentration of citrus fruit juices. He is employed by the American Distilling Company, San Francisco, California.

ANDREW G. DUMEZ, F.A.I.C., received the Ph.D. degree from the University of Wisconsin. Specializing in general and physical chemistry, analytical chemistry, and pharmaceutical chemistry, he is co-author of a text book on "Quantitative Pharmaceutical Chemistry". His experience includes four years as director of the School of Pharmacy of the University of the Philippines at Manila. He is now dean of the School of Pharmacy of the University of Maryland, Baltimore, Md.

E. J. DURHAM, F.A.I.C., was graduated from Reed College and later studied at Rice Institute from which he holds the Ph.D. degree. Specializing in physical, colloid, and analytical chemistry, and concentrated aqueous solutions, he is instructor of chemistry at New York University, New York, N. Y.

WALTER H. EDDY, F.A.I.C., obtained the B.S. degree from Amherst, and the Ph.D. degree from Columbia. Specializing in biochemistry and food chemistry, he has been director of the Bureau of Foods of *Good Housekeeping Magazine* since 1897. He is also professor of physiological chemistry at Teachers College, Columbia University, New York, N. Y.

JAMES E. EGAN, F.A.I.C., studied at DePauw University, and later at the University of Illinois, from which he received the Ph.D. degree. Specializing in apparatus and plant equipment, fats, fatty oils, waxes and soaps, and the teaching of chemistry, he has been employed since 1918 by the Procter and Gamble Manufacturing Company (Port Ivory, Staten Island, New York), where he holds the position of chemical superintendent.

CLARENCE V. EKROTH, F.A.I.C., holds the Ch.E. degree from Pratt Institute and the B.S. degree from Brooklyn Polytechnic Institute. Particularly interested in industrial chemical engineering; nutrition and hygiene; biochemistry and immunochemistry; concentration and dehydration of organic materials; composition and legal standards of foods and drugs; technical processes, and toxicology, he is president and director of the Ekroth Laboratories, Inc., New York, N. Y.

CONRAD A. ELVEHJEM, F.A.I.C., was graduated from the University of Wisconsin with the Ph.D. degree. He specializes in studies on vitamins, especially the vitamin B complex, mineral elements such as calcium, iron, copper, manganese, and zinc in nutrition and tissue respiration, and has published more than fifty papers on these subjects. He is professor of agricultural chemistry at the University of Wisconsin, Madison, Wis.

CHARLES R. ELY, F.A.I.C., received the A.M. degree from Yale University, the M.A. degree from Gallaudet College, and the Ph. D. degree from Columbian University (now George Washington University). He is the author of several papers on various subjects, including those concerning the education of the deaf, a subject in which he is particularly interested. He is vice-president and professor of natural science, Gallaudet College, Columbia Institution for the Deaf, Washington, D. C.

JOHN B. ENTRIKIN, F.A.I.C., obtained the M.A. degree from Southwestern University (Texas), and the Ph.D. degree from the State University of Iowa. Particularly interested in organic chemistry, general industrial chemistry, water, and the teaching of chemistry, he is the author of several articles on these subjects. He is head of chemistry department and professor of general and organic chemistry at Centenary College of Louisiana, Shreveport, La.

CHEMISTS ABROAD

By James N. Taylor, F.A.I.C.

"THREE months' notice for a research chemist should be the minimum," Deputy Judge Tudor Rees at Willesden (England) County Court is reported to have said during a recent case heard before him. Under the caption, "The Economic Status of the Chemist", the *Chemical Trade Journal and Chemical Engineer (London)*, for October, 1936, comments editorially: "If the British Association of Chemists had no other achievement to its credit, that whereby through its activities the principle that under normal circumstances the minimum period of notice necessary for a qualified chemist is three months has been firmly established in this country, would be ample. When the Association was registered as a trade union, the opinion was freely expressed in certain quarters that such action was somewhat incompatible with the dignity of the profession. We imagine that this attitude can be held by very few today, for it has only been its trade union status that has allowed the Association to take action in matters directly affecting the economic status of the chemist. The inauguration by the Association of its Unemployment Benefit Fund was a drastically radical departure by an organization of chemists; one which demanded a good deal of courage, but which has been fully justified by its results. The Association's activities, as is well known, however, have been far from confined to economic matters alone, and it is difficult to see how the claims of the Association to participate in any attempt to consolidate the chemical profession as a whole can be overlooked. There is one point which may be mentioned in connection with the case which came before the Willesden County Court last week, and at which the General Secretary of the Association gave evidence—the only evidence heard on the point—as to the custom in the profession in regard to length of notice to chemists. Actual membership of the Association is confined to British subjects, but there is a special rule under which qualified foreign chemists while resident in this country are admitted as Associates."

"OBJECTIVES could properly have been the title of the Presidential Address delivered by Dr. G. F. New at the October meeting of the Oil and Colour Chemists' Association in London. Dr. New's address was actually entitled, "The Objects of Our Association," and it presented a number of aspects of the relations between the chemist and his Association. He spoke of the width of interests among Association members as an evidence of the strides made by the chemist from the day when he was employed as a "doubtful venture." His statement that the chemist's Association should also cater to these wider interests is indicative of the progressive modern concept of the relationship between employer and employee and the part that the professional chemical organization should play in advancing the interests of its membership. Dr. New's address, contrary to the usual procedure, was opened to discussion, particularly, it is understood, with regard to policy.

THE TRAINING of chemists, as of other professional men, has for its necessary basis a broad general education for character, culture and citizenship—in the achievement of which the teaching of science can play a distinctive part, stated Professor J. C. Philip, O.B.E., D.Sc., F.R.S., in his presidential address delivered to Section B. Chemistry at the British Association Meeting held at Blackpool on September 9-16, 1936, according to *The Industrial Chemist* (*London*). Owing to the extreme diversity of the tasks which the chemist may be called upon to undertake in his professional career, it is the basic principles of the science that should mainly occupy his attention during his university curriculum. His training must be on broad fundamental lines, and any attempt to plan a university undergraduate course with a view to preparation for some specific chemical occupation, such as paper-making or dyestuff manufacture, is entirely misconceived.

On the other hand, the breadth of the chemist's undergraduate training may be sacrificed to intensive and perhaps excessive study of some academic aspect of the subject. The criticism is made today that our graduates in chemistry are weak in their grasp of the fundamentals of the science. It is said that they can talk at length about nuclear spins, valency angles, electron sinks, energy levels and so on, but are astonishingly uncertain about more elementary and practical matters . . . The present prominence of this "armchair" chemistry suggests that there is another consideration which we academic people are apt to forget. So far at least as the service of the community is concerned, chemistry is a practical science and the most of the students under training are to be practising chemists. Academic purists may protest that chemistry is a philosophical discipline, not a bread and butter affair, and that anything savouring of vocational training is foreign to the function of a university. It is, however, to the national interest that knowledge and action should be coordinated and that our universities should not be divorced from practical affairs.

I.C.I. *Magazine* for October, 1936, under the caption "The Benign Chemist" calls attention to the distinguished career of Mr. C. J. T. Cronshaw, who has done much to assist in the extraordinary development of the dye industry since the War. In his recent address to the British Association at Blackpool, however, he left the specific subject of dyes in order to refute the impression, given by much talk of poison gas, that the organic chemist is "a particularly devilish and satanic fellow." He showed that, on the contrary, this worthy citizen was responsible for many of the blessings and amenities of modern life. Anaesthetics and pain relieving drugs, the colours that beautify clothing and surroundings, silks and perfumes, the cinema, and even motoring, were wholly or partly his achievements. While all the products that have been used as poison gases were discovered accidentally, with no thought of their noxious characteristics, such triumphs as the discovery of two new fibres for the textile industry within thirty years were the result of the patient and laborous teamwork of British organic chemists, who have thus made valuable contributions to humanity.

Science Simplified for Steel Works Stenographers

I assume in the beginning
You are all aware that "twinning"
Has an allotropic form in Newmann bands,
And the phenomenon of "slip"
In cold distorted strip
Is something everybody understands.

It was controversial, quite,
As to what was martensite
Until Jeffries and Archer took the case,
It is ferrite, they surmised
Finely grained and crystallized
Having body centered lattices in space.

Now Arnold still insists
That martensite consists
Of a carbide holding ferrite in suspension.
While the needles, Osmond feels,
Seen in martensitic steels
Are pseudomorphs of twinnings due to tension.

Now next I will explain
That each individual grain
Is anisotropic—then I will relate
How this anisotropic grain
In the mass will give again
A pseudo-isotropic aggregate.

If a liquid isn't pure,
When solidified, it's sure
(An eminent professor so insists)
To show some indication
Of dendritic segregation
Since heterogeneity exists.

Dr. Rosenhain proclaims
That on cooling there remains
An amorphous intercrystalline cement
While distortion of the lattice
Causes hardening, and that is
Because adjacent atoms will be bent.

Now it's interesting I think
That zirconium and zinc,
With lattices hexagonal close-packed,
If distorted when they're cold
(By Jeffries we are told)
Are tolerably certain to be cracked.

While iron, he relates,
In its alpha and beta states,
Has body-centered lattices, and though
It should be rank futility
To look for good ductility
Yet curiously enough it isn't so.

—L. Gerald Firth in *Metals and Alloys.*

The Invention of the Thermometer

Santorio Santorio, a physician of great prominence, was born in Capo d'Istria, Italy, in March, 1561. After obtaining his degree of Doctor of Medicine in 1587, he became physician at the Court of the King of Poland. In 1601 he returned to Italy, becoming Professor of Theoretical Medicine at the University of Padua. Here he developed great scientific activity, particularly in studying the fluctuations of the weight and temperature of the human body in health and disease.

In connection with this latter work, Santorio invented the first two-part thermometer. This consisted of a glass flask filled with colored water, a long, thin glass tube ending at the top in a pear-shaped bulb.

The two extreme points were obtained by applying a candle-flame to the bulb and by surrounding it with snow.

Santorio's thermometer passed into Galileo's possession and led the latter to study thermometry.

Fahrenheit, in turn, obtained his incentive from both Santorio and Galileo, and commenced his researches in the field of thermometry about 1708.

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*Scioscopy**

One of the apostles of scioscopy writes, "Know your chemical type so that you may be aware of the food that blends with your chemicanalysis." It is amazing to learn from this proponent that the "calcium man" is the pioneer. He is the inventor and the originator, the man of concentration and the bearer of burdens. He is a builder, fighter, and executive, the type of man who can accomplish much and say little. There are few "calcium women." Many famous beauties are "carbon women." The "carbon woman" is fair and pleasing and usually possesses a pink and creamy white skin. The "sulfur woman" is a beautiful creature of moods. The "phosphorus man or woman" is delicate, refined, high minded and cultured, and has a pear-shaped face and wistful eyes. The "hydrogen men" rise to high positions, while "hydrogen women" are quiet and cool, but have fiery tempers.

—Harriet Morgan in *Hygeia.*

*"Systematized ignorance, the most delightful science in the world because it is acquired without labor or pains and keeps the mind from melancholy."

The Sousometer

A "sousometer" test to provide scientific data on degrees of intoxication, ranging from "dry and decent" to "dead drunk," was outlined by Lieutenant Commander W. W. Hall. In "The United States Naval Medical Bulletin" he reviewed clinical evidence by which intoxication might be determined and described methods for chemical determination of the concentration of alcohol in the blood, breath or other body fluids.

The chemical findings of the tests were classified as:

Less than one milligram of alcohol to a cubic centimeter: "Dry and decent."

One to one and one-half milligrams: "Delighted and devilish."

Two to three milligrams: "Delinquent and disgusting."

Three to four milligrams: "Dizzy and delirious."

Four to five milligrams: "Dazed and dejected."

More than five milligrams: "Dead drunk." —*Associated Press.*

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The "Vierdezilitera bga beagitationkommission" was recently founded in Berne, Switzerland, to work against the proposed decrease in the size of beermugs from 500 to 400 cubic centimeters, thus insidiously allowing restaurateurs to increase the price of beer.

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Chemistry Professor: "Jones, what does HNO_3 signify?"

Cadet Jones: "Well, ah, e'rr — I've got it right on the tip of my tongue, sir."

Chemistry Professor: "Well, you'd better spit it out. It's nitric acid."

—*Army & Navy Journal.*